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10/066,069	01/31/2002	Liqin Dong	CISCP744	2503

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EXAMINER	
NG, CHRISTINE Y	
ART UNIT	PAPER NUMBER
2616	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/066,069	DONG ET AL.	
	Examiner	Art Unit	
	CHRISTINE NG	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5-12,15-18 and 20-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5-12,15-18 and 20-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claim is objected to because of the following informalities:

In claim 3 line 1, "2" should be changed to --1--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3, 5-12, 16-18 and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,625,161 to Su et al in view of U.S. Patent No. 6,731,639 to Ors et al.

Referring to claim 1, Su et al disclose a method for defining hardware routing paths in a network having IP paths to a destination node, the method comprising:

Receiving path information (destination IP address) for a plurality of paths in a path group (a stream of packets), the path group comprising IP paths, each of the IP paths represented by an IP address (destination IP address). Refer to Column 4, lines 7-15.

Assigning (Figure 3, step 21 and Figure 4, assignment unit 131) a unique path ID (unique key assigned based on a common destination IP address) for each path within the path group, the path ID for each path comprising an IP address. The process examines a continuous stream of packets for a predetermined common attribute in the

packet header, such as the destination IP address. Assignment unit 131 then generates a unique key for the path based on the common destination IP address. Refer to Column 4, lines 49-59 and Column 5, line 39 to Column 6, line 26.

Comparing (Figure 3, step 23) all path IDs in each path group. The process groups the continuous stream of packets into one or more traffic aggregates based on the common destination IP address. Refer to Column 4, lines 59-67.

Assigning (Figure 3, step 25 and Figure 4, mapping unit 133) a common hardware resource (communication channel or link) to groups having matching path IDs. Mapping unit 133 maps common unique keys to certain communication channels. Refer to Column 5, lines 1-7 and Column 5, line 39 to Column 6, line 26.

Wherein the path ID assigned for each of said IP paths comprises a unicast IP address. Examples of destination IP addresses include 193.23.33.6, 168.23.45.16, 127.188.169.70, and 127.188.169.90, which are unicast IP addresses. Refer to Column 4, lines 62-67 and Column 5, lines 59-63.

Su et al also do not disclose that the path group also comprises MPLS paths, that each of the MPLS paths are represented by a label, and that the path ID assigned for each of said MPLS paths comprises a unique IP multicast address.

Ors et al disclose in Figure 1 an IP network with a switching node 46 that communicates with all the end systems 44 using an IP multicast communication system. The switching node 46 assigns a unique IP multicast label (MPLS label) to each MPLS path in the network and assembles the labels into a routing table. Each MPLS path is unique in that each leads to one of the two different intermediate destinations (LER 50

and LSR 52) using one of the three QoS. All cells destined to the same intermediate destination using the same QoS can use the same label and flow together to their same destination. Refer to Column 6, lines 39-60; and Column 8, line 35 to Column 9, line 43. Specifically, switching node 46 "sends the requested MPLS label routing information to the end user by a multicast communication by assembling an IP packet containing the request MPLS label routing information..." (Column 9, lines 33-36). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the path group also comprises MPLS paths, that each of the MPLS paths are represented by a label, and that the path ID assigned for each of said MPLS paths comprises a unique IP multicast address. One would be motivated to do so in order to assign each MPLS path a different multicast label, so that all multicast packets being sent on the same path can utilize the same label, thereby reducing the number of labels to save resources. MPLS allows for faster data processing since a path is pre-established for the packets.

Referring to claim 3, Su et al disclose that the unicast IP address corresponds to the IP path's next hop IP address. The next hop can be a destination address. Refer to Column 4, lines 59-67.

Referring to claim 5, Su et al do not disclose that assigning a unique IP multicast address comprises assigning a unique IP address from an internal managed group of IDs.

Ors et al disclose in Figure 4b that an IP multicast address (MPLS label) is chosen from the routing table in the switching node 46, the routing table being an

internal managed group of six IDs representing intermediate destinations (LER 50 and LSR 52) and three different QoS. All cells destined to the same intermediate destination using the same QoS can use the same label and flow together to their same destination. Refer to Column 5, line 25 to Column 6, line 38; Column 7, lines 51-63; and Column 8, line 35 to Column 10, line 15. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that assigning a unique IP multicast address comprises assigning a unique IP address from an internal managed group of IDs. One would be motivated to do so in order to assign each MPLS path a different multicast label as predetermined in a routing table, so that all multicast packets being sent on the same path can utilize the same label, thereby reducing the number of labels to save resources.

Referring to claim 6, Su et al do not disclose wherein the internal managed group of IDs sufficient large to represent all network hardware paths.

Ors et al disclose in Figure 1 that each MPLS path is unique in that each leads to one of the two different intermediate destinations (LER 50 and LSR 52) using one of the three QoS. All cells destined to the same intermediate destination using the same QoS can use the same label and flow together to their same destination. The routing table displays all possible network paths since the switching node 46 is connected to only two intermediate destinations. Refer to Column 5, line 25 to Column 6, line 38; Column 7, lines 51-63; and Column 8, line 35 to Column 10, line 15. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein the internal managed group of IDs sufficient large to represent all network

hardware paths. One would be motivated to do so in order to represent all network paths so that all packets utilizing the same path can share the same label, thereby reducing the number of labels to save resources.

Referring to claim 7, Su et al do not disclose assigning a unique IP address comprises assigning a unique IP address for each software MPLS path entity.

Ors et al disclose that in Figure 1 that each MPLS path is unique in that each leads to one of the two different intermediate destinations (LER 50 and LSR 52) using one of the three QoS. All cells destined to the same intermediate destination using the same QoS can use the same label and flow together to their same destination. Each possible path is assigned a unique IP address since the switching node 46 is connected to only two intermediate destinations. Refer to Column 5, line 25 to Column 6, line 38; Column 7, lines 51-63; and Column 8, line 35 to Column 10, line 15. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include assigning a unique IP address comprises assigning a unique IP address for each software MPLS path entity. One would be motivated to do so in order to represent all network paths so that all packets utilizing the same path can share the same label, thereby reducing the number of labels to save resources.

Referring to claim 8, Su et al do not disclose returning an assigned unique IP address to the group of internal managed IDs when a path entity is deleted.

Ors et al disclose in Figure 1 that the switching node 46 assigns a unique IP multicast label (MPLS label) to each MPLS path in the network and assembles the labels into a routing table. When sending a packet, the system places the MPLS label

into the header of the packet to be sent; after packet transmission, the label is no longer needed. Refer to Column 5, line 25 to Column 6, line 38; Column 7, lines 51-63; and Column 8, line 35 to Column 10, line 15. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include returning an assigned unique IP address to the group of internal managed IDs when a path entity is deleted. One would be motivated to do so in order allow future packets towards the same destination with the same QoS to utilize the MPLS label, thereby reducing the number of labels to save resources.

Referring to claim 9, Su et al disclose that the method further comprises sorting (Figure 3, step 23 and Figure 4, mapping unit 133) the paths in each of the path groups. Mapping unit 133 creates a look-up table which maps common unique keys assigned to particular destination IP addresses to certain communication channels. Refer to Column 5, lines 1-7 and Column 5, line 39 to Column 6, line 26.

Referring to claim 10, Su et al disclose that sorting (Figure 3, step 23 and Figure 4, mapping unit 133) the paths comprises sorting the paths by the value of the path ID. Mapping unit 133 creates a look-up table which maps common unique keys to certain communication channels. Refer to Column 5, lines 1-7 and Column 5, line 39 to Column 6, line 26.

Referring to claim 11, Su et al disclose in Figure 5 that the method further comprises building a database (memory 89) containing all path groups and using the database to compare the paths groups. Memory 89 "stores a lookup table in which

groups of packets are assigned to communication channels 91A-91C". Refer to Column 10, lines 37-47 and Tables 1-3.

Referring to claims 12 and 17, refer to the rejection of claim 1. Furthermore, Su et al disclose in Figure 5 means (memory 89) for storing the path IDs. Memory 89 "stores a lookup table in which groups of packets are assigned to communication channels 91A-91C". Refer to Column 10, lines 37-47 and Tables 1-3.

Referring to claim 16, refer to the rejection of claim 6.

Referring to claim 18, Su et al disclose in Figure 4 programming entries in a route table (Table 1) and adjacency table (Table 2) to define hardware resources. The mapping unit 133 creates or updates a look-up table (Table 1) which maps traffic aggregates to communicaton channels. The mapping unit 133 also provides a queue mapping table (Table 2) that associates queues with links. Refer to Column 5, line 39 to Column 7, line 42.

Referring to claim 20, Su et al disclose in Figure 3 that said path group comprises paths having corresponding source routers and destination routers. The process examines a continuous stream of packets for a predetermined common attribute in the packet header, which could be the IP destination address or the IP source and destination address. Refer to Column 4, lines 13-15 and Column 4, lines 49-59.

Referring to claim 21, Su et al disclose that the common hardware resource is a hardware path (communication channel or link). Refer to Column 5, lines 1-7.

Referring to claim 22, Su et al disclose wherein comparing said path IDs comprises comparing path IDs in a prefix's path group. The process groups the continuous stream of packets into one or more traffic aggregates based on the common destination IP address, which contains prefixes. Refer to Column 4, lines 59-67.

Referring to claim 23, Su et al do not disclose wherein the IP multicast address is obtained from a pool of identifiers.

Ors et al disclose in Figure 4b that an IP multicast address (MPLS label) is chosen from the routing table in the switching node 46, the routing table being a pool of six IDs representing intermediate destinations (LER 50 and LSR 52) and three different QoS. All cells destined to the same intermediate destination using the same QoS can use the same label and flow together to their same destination. Refer to Column 5, line 25 to Column 6, line 38; Column 7, lines 51-63; and Column 8, line 35 to Column 10, line 15. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein the IP multicast address is obtained from a pool of identifiers. One would be motivated to do so in order to assign each MPLS path a different multicast label as predetermined in a routing table, so that all multicast packets being sent on the same path can utilize the same label, thereby reducing the number of labels to save resources.

4. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,625,161 to Su et al in view of U.S. Patent No. 6,731,639 to Ors et al, and in further view of U.S. Patent No. 6,728,268 to Bird.

Su et al do not disclose wherein the path IDs assigned for MPLS paths comprise

broadcast IP addresses of form 255.x.x.x.

Bird discloses in Figure 2 the protocol layers of an IP host. If the next hop IP address is a broadcast address, CAN/IP 205 uses the global address of 255. If the next hop IP address is a multicast address, CAN/IP 205 also uses the global address of 255. Refer to Column 5, line 66 to Column 6, line 3; and Column 8, lines 4-31. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein the path IDs assigned for MPLS paths comprise broadcast IP addresses of form 255.x.x.x. One would be motivated to do so since 255.x.x.x is the conventional broadcast network address.

5. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,625,161 to Su et al in view of U.S. Patent No. 6,731,639 to Ors et al, and in further view of U.S. Patent No. 6,795,863 to Doty, Jr.

Su et al do not disclose wherein the IP multicast addresses assigned to said MPLS paths each comprises a common prefix and wherein said prefix is different than a prefix of the unicast IP addresses and said path IDs.

Su et al disclose that examples of destination IP addresses include 193.23.33.6, 168.23.45.16, 127.188.169.70, and 127.188.169.90, which are unicast IP addresses. Refer to Column 4, lines 62-67 and Column 5, lines 59-63. Doty, Jr disclose that multicast IP addresses range from 224-239. Refer to Column 2, line 56 to Column 3, line 3. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein the IP multicast addresses assigned to said MPLS paths each comprises a common prefix and wherein said prefix is different

than a prefix of the unicast IP addresses and said path IDs. One would have been motivated to do so since unicast and multicast IP addresses are assigned different prefixes in order to differentiate between them.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTINE NG whose telephone number is (571)272-3124. The examiner can normally be reached on M-F; 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Firmin Backer can be reached on (571) 272-6703. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

C. Ng
April 25, 2008

/FIRMIN BACKER/
Supervisory Patent Examiner, Art Unit 2616